

We claim:

- 1 1. A system for processing data, comprising:
  - 2 a processing pipeline including a plurality of stages connected serially to
  - 3 each other so that an output element of a previous stage is sent as an input element
  - 4 to a next stage, and a first stage is configured to receive input for a processing
  - 5 request, and a last stage is configured to produce output corresponding to the input;
  - 6 a progressive cache including a plurality of caches arranged in an order from
  - 7 least finished cache elements to most finished cache elements, each cache for
  - 8 receiving an output cache element of a corresponding stage and for sending an
  - 9 input cache element to a next stage after the corresponding stage; and
  - 10 a cache controller configured to route cache elements from the processing
  - 11 pipeline to the progressive cache in the order from a least finished cache element to
  - 12 a most finished cache element and from the progressive cache to the processing
  - 13 pipeline in the order from the most finished cache element to the next stage after
  - 14 the corresponding stage.
- 1 2. The system of claim 1, in which the progressive cache includes a cache for each
- 2 stage of the processing pipeline.
- 1 3. The system of claim 1, in which the output cache element is stored in the
- 2 corresponding cache.
- 1 4. The system of claim 1, further comprising:
  - 2 means for compressing the cache elements.
- 1 5. The system of claim 1, in which the cache elements are accessed by hashing.

- 1 6. The system of claim 1, in which least recently used cached elements are  
2 discarded when the progressive cache is full.
- 1 7. The system of claim 1, in which the input is a graphics object, and the output is  
2 an image.
- 1 8. A method for processing data, comprising:  
2 receiving a processing request, the processing request describing input to be  
3 processed;  
4 querying a progressive cache to determine a cached element most  
5 representing an output satisfying the processing request;  
6 sending the cached element to a starting stage of a processing pipeline, the  
7 starting stage associated with the cached element; and  
8 sending an output of the starting stage as input to a next stage of the  
9 processing pipeline, a final stage of the processing pipeline determining the output  
10 satisfying the processing request.
- 1 9. The method of claim 8 wherein an output of a particular stage of the pipeline is  
2 sent to the progressive cache.
- 1 10. The method of claim 8 wherein the cache elements are compressed.
- 1 11. The method of claim 8 wherein the progressive cache finds the cache elements  
2 using hashing.

1 12. The method of claim 8 wherein the progressive cache eliminates least recently  
2 used cached elements from a particular cache in the set of caches when the  
3 particular cache is full.

1 13. The method of claim 8 wherein the starting stage associated with the cached  
2 element is a next stage of a corresponding stage of a cache of the progressive cache  
3 containing the cached element.

1 14. An apparatus for processing data, comprising:  
2 means for querying a progressive cache to determine a cached element most  
3 representing an output satisfying a processing request for input data;  
4 means for sending the cached element to a starting stage of a processing  
5 pipeline for the data, the starting stage associated with the cached element; and  
6 means for sending an output of the starting stage to an input of a next stage  
7 of the processing pipeline, a final stage of the processing pipeline determining the  
8 output satisfying the processing request for the input data.